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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/804,846	03/19/2004	Yi Hua Ma	1021.2005-001	7497

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EXAMINER

LAWRENCE JR, FRANK M

ART UNIT	PAPER NUMBER
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1724

DATE MAILED: 10/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/804,846

Applicant(s)

MA ET AL

Examiner

Frank M. Lawrence

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 April 2005.
2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-57 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-16, 19, 25-31, 34-44, 47-52 and 54-57 is/are rejected.
7) ☒ Claim(s) 17, 18, 20-24, 32, 33, 45, 46 and 53 is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 19 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: The incomplete sections in lines 26 and 28 of page 25 should be corrected.

Appropriate correction is required.

Claim Objections

2. Claim 38 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 38 recites that the materials used in the different layers are the same, however claim 36 also recites that they are the same by using "a solid layer of said hydrogen material" which is already defined in line 2.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 39 and 41 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 39 recites that the porous base layer is not comprised of hydrogen permeable material, however the layer must be hydrogen permeable to function in the disclosed system. The examiner understands that permeable material refers to a membrane material that is not porous or perforated, however this is not clear in the claims. Claim 41 is rejected for depending from a rejected base claim.

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5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 40, 42-44, 52 and 53 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The original specification does not disclose any of the limitations of the listed claims.

Double Patenting

7. Claims 1-8, 12, 13 and 36-39 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 27 and 31-39 of copending Application No. 10/804,847. Although the conflicting claims are not identical, they are not patentably distinct from each other because all of the limitations of the instant claims are fully encompassed and envisioned by the co-pending claims. One having ordinary skill in the art would understand that the composite membrane is capable of functioning over a range of thicknesses and that the Group IB metal would be chosen from silver, copper, or gold based on cost, availability and effectiveness.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 47, 48, 50 and 51 are rejected under 35 U.S.C. 102(b) as being anticipated by Edlund (5,498,278).

10. Edlund '278 teaches a method of purifying hydrogen, comprising selectively permeating hydrogen across a composite membrane, wherein the membrane includes a tubed-shaped porous metal support that can be palladium, a metal oxide intermediate layer overlying the support, and a palladium or palladium alloy membrane layer that is deposited on the intermediate layer (col. 7, line 23 to col. 9, line 15).

11. Claims 1, 12, 13, 15, 25-29, 35, 47, 49, 50 and 56 are rejected under 35 U.S.C. 102(b) as being anticipated by Peachey et al. (5,738,708).

12. Peachey et al. '708 teach a composite metal membrane for selectively permeating hydrogen from a gas mixture, comprising a porous metal substrate, an intermediate metal oxide or metal sulfide layer deposited on the substrate, and palladium or Pd/Ag alloy hydrogen permeable layers deposited on the intermediate layer on each side of the substrate (col. 2, line 58 to col. 4, line 12).

13. Claims 36-39, 41, 47, 49-52 and 54-57 are rejected under 35 U.S.C. 102(b) as being anticipated by Bossard (6,183,542).

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14. Bossard '542 teach a membrane for selectively permeating hydrogen from a gas mixture, comprising a palladium or Pd alloy membrane layer (30) that is sandwiched between two porous mesh layers (32, 34) that can be stainless steel using brazing with a layer of brazing powder.

Multiple layers of mesh having differing sizes can be added to each side of the membrane (col. 5, line 1 to col. 6, line 13). The mesh and membrane layers are contoured (figures 2, 3).

15. Claims 1, 10-13, 15, 25-29, 35, 47, 49 and 56 are rejected under 35 U.S.C. 102(b) as being anticipated by Drost et al. (2002/0020298).

16. Drost et al. '298 teach a supported membrane for selectively permeating hydrogen from a gas mixture, comprising porous or sintered metal support layer (3), an intermediate porous diffusion barrier layer (9) deposited on the support layer, and a palladium or Pd/Ag alloy membrane layer (2) deposited on the intermediate layer using chemical or physical vapor deposition (paragraphs 17-20, 34, 38, 39, 52-58). The intermediate layer has a thickness of less than 2 microns and has a lower porosity than the support layer (see figures).

17. Claims 1-3, 9, 10, 12-16, 25-31, 34, 35, 47-49 and 56 are rejected under 35 U.S.C. 102(b) as being anticipated by Ma et al. (6,152,987).

18. Ma et al. (6,152,987) teach a composite membrane for selectively permeating hydrogen from a reaction product mixture, comprising a tubular porous stainless steel substrate (12), a ceramic or metal oxide intermediate diffusion layer deposited on the substrate, and a palladium or Pd/Ag alloy membrane layer deposited on the intermediate layer using electroplating or other deposition techniques (see figure, col. 1, lines 30-32, col. 3, lines 21-54, col. 4, lines 12-65, col. 5, line 45 to col. 6, line 38, col. 7, lines 21-60). Other metals such as Fe, Ni, Ti, Cr, Al and alloys may be used as the substrate material. The intermediate layer can have a thickness than

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can vary from a few microns to tens of microns, and a second metal oxide intermediate layer can be bonded to the first intermediate layer, anticipating the embodiment of claim 14. The first intermediate layer can be formed by oxidizing the surface of the substrate, anticipated the embodiment of claim 16.

Claim Rejections - 35 USC § 103

19. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

20. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ma et al. '987.

21. Ma et al. '987 disclose all of the limitations of the claim except that the intermediate layer is applied by electroless plating, but discloses that any conventional method can be used and that electroless plating is used to deposit the membrane layer. One having ordinary skill in the art at the time of the invention would have known to use electroless plating or any other suitable method that would effectively deposit the intermediate layer in a controlled manner and thickness.

Allowable Subject Matter

22. Claims 17, 18, 20-24, 32, 33, 45, 46 and 53 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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Interference

23. Applicant's communication regarding a potential interference has been considered. An interference has not been declared because all of the claims in each application are not in condition for allowance.

Conclusion

24. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The additional references listed on the attached PTO-892 form disclose hydrogen selective membranes.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Frank M. Lawrence whose telephone number is 571-272-1161.

The examiner can normally be reached on Mon-Thurs 7:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on 571-272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Frank M. Lawrence
Primary Examiner
Art Unit 1724

10-17-05

Frank Lawrence

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